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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/580,678

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Marcel Bouffier

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Davidson, Davidson & Kappel, LLC
485 7th Avenue
14th Floor
New York, NY 10018

EXAMINER

PALABRICA, RICARDO J

ART UNIT

PAPER NUMBER

3663

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,678	Applicant(s) BOUFFIER, MARCEL	
	Examiner Rick Palabrica	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-25 is/are rejected.
- 7) ☒ Claim(s) 24 (page 5) is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's 2/5/09 Amendment, which amended claims 12-22 and added new claims 23-25, and traversed the rejection of claims in the 11/4/08 Office action, is acknowledged.

Response to Arguments

2. Applicant traversed applied art, Nagano et al. (U.S. 5,249,211) and Aoyama et al. (U.S. 4,689,195) on the grounds that: a) both references fail to show "a fuel assembly for a pressurized water reactor"; b) enrichment levels of the fuel rods is not a matter of design/optimization because neither reference teaches "enrichment levels of the fuel rods in a pressurized water reactor."

The examiner disagrees.

As to argument a), the claims are directed to an apparatus, i.e., a fuel assembly. The limitation, "for a pressurized water reactor" is not a structural limitation of the claimed apparatus but a statement of intended or desired use. As stated in section 1 of the 11/4/08 Office action, MPEP 2114 provides that a statement of intended or desired use does not differentiate the claimed apparatus from the prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim, which is the case for either one of Nagano et al. or Aoyama et al."

As to argument b), again applicant's arguments are not based on the structural limitations of the claimed apparatus. Also, the constraints that the examiner highlighted

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as determinants of enrichment in an optimization process apply to either a PWR or BWR.

3. In an attempt to prove novelty or non-obviousness of his invention, applicant argues that “[z]oned configurations have not been used in PWR fuel assemblies containing UO_2 fuel and at the time of the invention one of skill in the art would have no reason to do so.”

The examiner disagrees.

First, applicant himself admits that zoned assemblies have been known in the PWR field for MO_x fuel assemblies (see Remarks, page 7 of the 2/5/09 Amendment).

MO_x fuel contains UO_2 .

Second, Hesketh et al. (U.S. 2003/0123600), which has a date prior to the instant application teaches zoned fuel assemblies for PWRs containing UO_2 .

Therefore, based on applicant’s own admission and the above prior art, the invention is neither novel nor non-obvious.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 13 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The new matter pertains to the new limitation, "neutron containment", which is neither disclosed nor suggested nor taught in the original specification.

5. Claims 13 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There is neither an adequate description nor enabling disclosure of the limitation of what is meant by or encompassed by the term, "neutron containment."

6. Claims 13 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague, indefinite and incomplete, and their metes and bounds cannot be determined, particularly in regard to the term "neutron containment." It is not known what all is meant by or encompassed by this term.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 12-17, and 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Nagano et al. (U.S. 5,249,211) or Aoyama et al. (U.S. 4,689,195) or Sofer et al. (U.S. H722), who each disclose a fuel assembly comprising fuel rods arranged at nodes of a substantially regular network having a polygonal outer contour, the rods containing uranium enriched in isotope 235 and not containing any plutonium before the assembly is used in a reactor.(see Abstract of each reference)

Nagano et al.

As to claim 12, applicant's claim language reads on Nagano et al.'s fuel assembly as follows (e.g., see Fig. 1): a) "first central group" reads on the group of rods designated as "1"; b) "second group" reads on the group of fuel rods designated as "3" and "4" on the outer contour (i.e., outermost rows and columns); b) "third group" reads on rods designated as "5" arranged at the corners of the fuel assembly. Note that the third group has a uranium-235 enrichment that is less than the second group's enrichment and the latter has an enrichment that is less than the first group's enrichment (see Fig. 1B).

As to claims 13 and 23, the examiner interprets "neutron containment" as neutron poison or neutron absorber. The fuel rods in Nagano et al. inherently include

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neutron poison/absorber, e.g., non-uranium elements or impurities in the fuel material, or fission products that are inherently produced when the rods are used during operation of the nuclear reactor.

As to claims 14 and 17, the second group (i.e., rods “3” and “4”) extends, for each of the faces of the outer contour of the network of rods, and the third group (i.e., rods “5” comprises only the fuel rods at the corners of the outer contour.

As to claim 15, Nagano et al. meet the claim limitation because the uranium enrichment is dependent upon the U-235/U-238 ratio, and a higher enrichment requires a higher U-235/U-238 mass ratio.

As to claim 21, the fuel rod network in Nagano et al. has a square outer contour (see Fig. 1A).

As to claim 22, it is inherent that when the fuel assembly of Nagano et al. is used in an operating reactor, at least two of these assemblies are required to achieve criticality and the required operating level.

Aoyama et al.

As to claim 12, applicant’s claim language reads on Aoyama et al.’s fuel assembly as follows (e.g., see Fig. 11 and Table 5): a) “first central group” reads on the group of fuel rods designated as “19” at rows 3-5 and columns 2-6; b) “second group” reads on the group of fuel rods designated as “21” and “22” on the outer contour (i.e., outermost rows and columns); c) “third group” reads on rods designated as “23” arranged at the corners of the fuel assembly. Note that the third group has a uranium-

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235 enrichment that is less than the second group's enrichment and the latter has an enrichment that is less than the first group's enrichment.

As to claims 13 and 23, the examiner interprets "neutron containment" as neutron poison or neutron absorber. The fuel rods in Aoyama et al. inherently include neutron poison/absorber, e.g., non-uranium elements or impurities in the fuel material, or fission products that are inherently produced when the rods are used during operation of the nuclear reactor.

As to claims 14 and 17, the second group (i.e., rods "21" and "22") extends, for each of the faces of the outer contour of the network of rods, and the third group (i.e., rods "23" comprises only the fuel rods at the corners of the outer contour.

As to claim 15, Aoyama et al. meet the claim limitation because the uranium enrichment is dependent upon the U-235/U-238 ratio, and a higher enrichment requires a higher U-235/U-238 mass ratio.

As to claim 21, the fuel rod network in Aoyama et al. has a square outer contour (see Fig. 1A).

As to claim 22, it is inherent that when the fuel assembly of Aoyama et al. is used in an operating reactor, at least two of these assemblies are required to achieve criticality and the required operating level.

Sofer et al.

As to claim 12, applicant's claim language reads on Sofer et al.'s fuel assembly as follows (e.g., see Fig. 2): a) "first central group" reads on the group of fuel rods

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designated as "H" at col. 4 between rows 3- 6 and at row 6 between cols. 4-7 ; b) "second group" reads on the group of fuel rods designated as "L" and "ML" on the outer contour (i.e., outermost rows and columns); b) "third group" reads on rods designated as "LL" arranged at the corners of the fuel assembly. Note that the third group has a uranium-235 enrichment that is less than the second group's enrichment and the latter has an enrichment that is less than the first group's enrichment.

As to claim 13 and 23, the examiner interprets "neutron containment" as neutron poison or neutron absorber. The fuel rods in Sofer et al. inherently include neutron poison/absorber, e.g., non-uranium elements or impurities in the fuel material, or fission products that are inherently produced when the rods are used during operation of the nuclear reactor.

As to claims 14 and 17, the second group (i.e., rods "L" and "ML") extends, for each of the faces of the outer contour of the network of rods, and the third group (i.e., rods "LL" comprises only the fuel rods at the 3 corners of the outer contour. Note that the claims do not recite that the rods in the third group are disposed at all corners of the assembly.

As to claim 15, Sofer et al. meet the claim limitation because the uranium enrichment is dependent upon the U-235/U-238 ratio, and a higher enrichment requires a higher U-235/U-238 mass ratio.

As to claim 21, the fuel rod network in Sofer et al. has a square outer contour (see Fig. 1A).

As to claim 22, it is inherent that when the fuel assembly of Sofer et al. is used in an operating reactor, at least two of these assemblies are required to achieve criticality and the required operating level.

The claims are replete with statements that are either essentially method limitations or statements of intended or desired use. For example, “for a pressurized water reactor,” “for receiving rods of a control rod cluster”, etc. These clauses, as well as other statements of intended use do not serve to patently distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

[A]pparatus claims cover what a device is, not what a device does.” Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525,1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

Any one of the systems in the cited references is capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited references.

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8. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by Nagano et al. The value of e1 is 4.11% (see page 7, last paragraph of the Specification). Thus, e2 has a value from 3.31% to 3.91%, based on the claim. Nagano et al. discloses in Fig. 1B a second level of enrichment (i.e., an average enrichment for fuel rods designated as “3” and “4”) that falls within the 3.31% to 3.91% range.

As to the applied art meeting the claim limitation, MPEP 2131.03 states:

“[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is ‘anticipated’ if one of them is in the prior art.” *Titanium Metals Corp. v. Banner*; 778 F.2d 775, 227 USPQ 773.

9. Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Nagano et al. The value of e1 is 4.11% (see page 7, last paragraph of the Specification). Thus, e3 has a value from 2.31% to 3.51%, based on the claim. Nagano et al. discloses in Fig. 1B a third level of enrichment (i.e., an average enrichment for fuel rods designated as “5”) that falls within the 2.31% to 3.51% range.

10. Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by Aoyama et al., who disclose a first level of enrichment equal to 3.6%.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of Nagano et al. or Aoyama et al. or Sofer et al. in view of Berglund et al. (U.S. 3,930,938). Nagano et al. or Aoyama et al. or Sofer et al. disclose the applicant's claim limitations except for the guide tube.

As to the skeleton, lower tie plate and upper tie plate, any one of Nagano et al. or Aoyama et al. or Sofer et al. either teach or inherently include these elements to provide a holding structure for the fuel rods.(e.g., see Fig. 12 in Nagano et al.). ,

Nagano et al. or Aoyama et al. or Sofer et al. teach a control rod of cruciform cross section with their central part located in the free space between four adjacent control assemblies. Berglund et al. teach an advantageous, alternative control rod configuration, i.e., finger control rod 5, positioned inside the fuel assembly and displaceable in guide tube 7(see Fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by any one of Nagano et al. or Aoyama et al. or Sofer et al., to use a finger control rod in place of a cruciform control rod, to gain the advantages thereof (i.e., for better fuel economy), because such modification is no more than the use of a well known expedient within the nuclear art, and the substitution of one control rod configuration by another well known configuration.

Claim Objections

12. Claim 24 (on page 5 of the amendment) is objected to because of the following informalities: the claim should be labeled as "25". Appropriate correction is required.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rick Palabrica/
Primary Examiner, Art Unit 3663

April 15, 2009